1st Weekly Report M145, Mindelo-Recife

13.02.-18.02.2018

The METEOR cruise M145 from Mindelo to Recife started on Tuesday, February 13, 2018, at the height of the Cape Verdean Carnival. On the one hand, we were able to gain an insight into the great festivities and processions through the city, on the other hand, also the preparations for the journey luckily ran smoothly. A smaller part of our equipment was already delivered to Catania, the departure port of M144-2, and thus was already on board when METEOR arrived in Mindelo. The remaining containers were then brought to the pier and the part of the scientific crew that arrived early was able to start unpacking the containers directly after METEOR's arrival. Already on Sunday almost the entire scientific crew was on board. The laboratories were set up, equipment was installed and the mooring work, which was to take place on the afternoon of the day of departure, was prepared.

With METEOR's departure from Mindelo began the last research cruise of the Kiel Collaborative Research Center 754 "Climate-Biogeochemical Interactions in the Tropical Ocean". From 2008-2019, 18 SFB754 research cruises to the tropical Atlantic and 13 cruises to the tropical Pacific were conducted. Many fundamental insights were gained on natural and anthropogenic changes in the oceanic oxygen content as well as on the underlying ocean dynamics, biogeochemistry and biology of the tropical oceans. This project has taken the interdisciplinary cooperation within GEOMAR and with our national and international partners to a new level. This can also be seen for our research cruise M145, in which researchers from 6 subprojects of the SFB754 as well as various national and international groups participate. The remaining time until the end of the SFB754 project in December 2019 will be dominated by the synthesis of observed data and model results. Furthermore, the foundation has been laid for a continuation of important time series that document climatic changes in the ocean beyond the SFB754 period. GEOMAR will continue to operate the interdisciplinary Cape Verde Ocean Observatory (CVOO) mooring. Additionally, in cooperation with the EU project AtlantOS and the international PIRATA program, oxygen and flow measurements will be carried out increasingly on PIRATA moorings. The evolution of oceanic oxygen content in the future and in particular the long-term deoxygenation and its consequences will certainly remain an important field of research in the coming years to decades.

Fig. 1: Departure of METEOR from the port of Mindelo on February 13. Mooring materials such as floatations and wires are already prepared for the first mooring deployment on the following day (Photo: PB).

After leaving the port of Mindelo (Fig. 1), our first activity was the service of the CVOO mooring. Shortly after successful recovery, the first time series have already been analyzed. In line with our previous studies, they show various eddies passing the mooring on their way from the northeast African upwelling area to the west. They are characterized by significantly reduced oxygen concentrations (Fig. 2). During the night, some CTD stations were used for the calibration of moored instrumentation and in the morning of the next day, the CVOO mooring could be deployed successfully.

The hydrographic section along 23°W took us from 15°N to 11°N. There, just east of the actual section, the first SFB754 oxygen mooring was recovered. Here in the center of the oxygen minimum zone, typically lowest oxygen values are observed at depths of about 400 m. We are looking forward seeing the calibrated oxygen values in comparison to previous mooring periods.

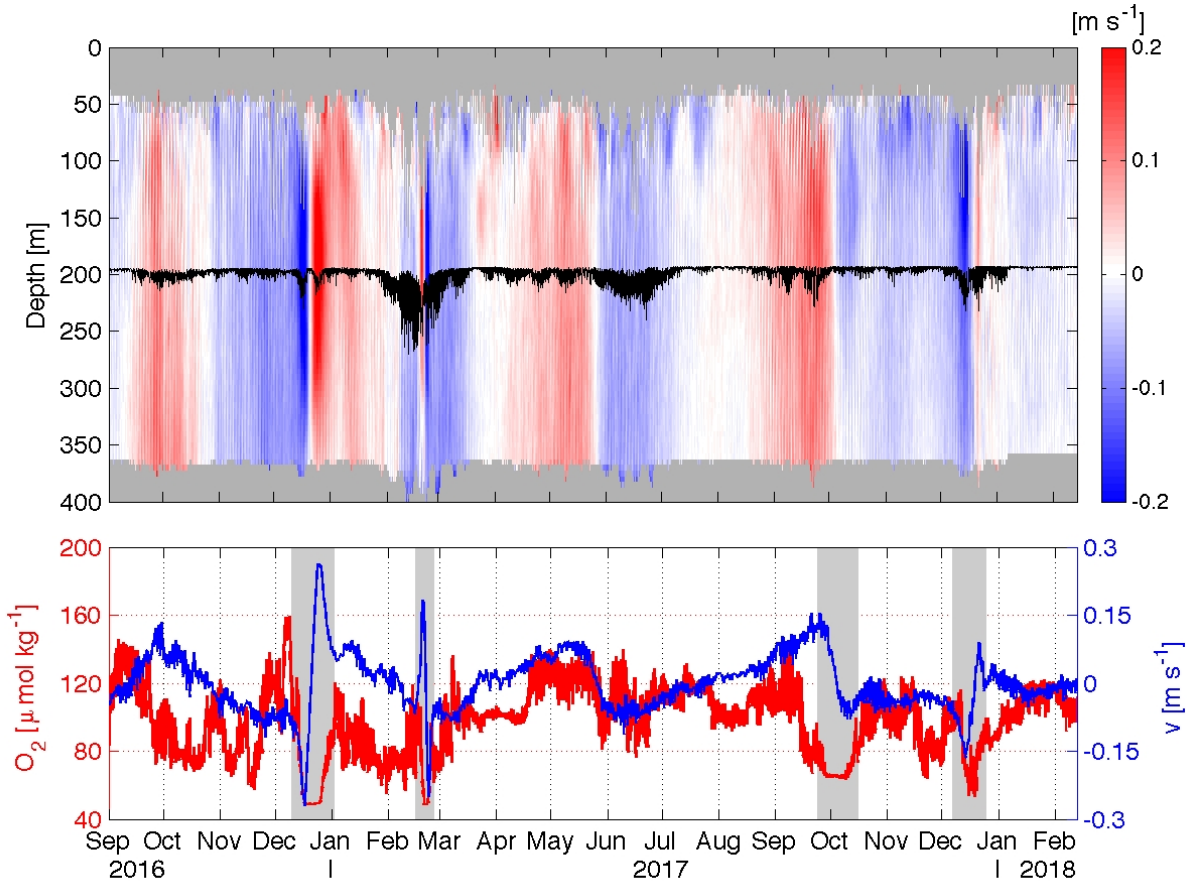

Fig. 2: Meridional velocity measured with the ADCP from the CVOO mooring (upper panel) and oxygen (red) and meridional flow (blue) at about 200m water depth (bottom panel). The depth of the oxygen sensor is shown in the upper panel as a black line. Eddy passages are marked by gray bars in the bottom panel (Fig. RH & JH).

After the first days, that have been exciting as always, the work routine with CTD probe, incubations and water analyzes has started. All scientists immediately felt at home on board METEOR. In particular our cruise participants who are traveling with METEOR for the first time were impressed by the technical capabilities and also the quality of life that this ship has to offer. Unfortunately, a severe hand injury of a crew member requires a stopover in Praia and thus a two-day interruption of our research work. We wish him all the best. Get well soon!

Greetings from the tropics,
Peter Brandt and the cruise participants of M145